Test 1

Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 If $x^2 + k x + 36$ is a perfect square , then k = ...

(a) ± 6 (b) ± 8 (c) ± 12 (d) ± 18

2 If the expression : $x^2 + k x + 2$ can be factorized , then k may be equal to .....

(a) 3 (b) -1 (c) 1 (d) 0

3 If $(2x + 3)$ is a factor of the expression : $2x^2 - x - 6$, then the second factor is .....

(a) $x - 6$ (b) $x - 2$ (c) $x + 6$ (d) $x + 2$

2 Factorize each of the following : (2 marks)

(a) $2x^3 - 8x$

(b) $x^3 + 8$

Test 2

Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 If $x^2 - y^2 = 12$, $x + y = 3$, then $x - y$ = ...

(a) $\sqrt{3}$ (b) 4 (c) 36 (d) ± 2

2 If the expression : $a x^2 + 36x + 81$ is a perfect square , then a = ...

(a) 2 (b) 4 (c) 8 (d) 16

3 If $x^2 + a = (x - 5)(x + 5)$, then a = ...

(a) 5 (b) 25 (c) -25 (d) ± 25

2 Factorize each of the following : (2 marks)

(a) $2x^2 - 5x + 2$

(b) $4x^2 - 25y^2$

Test 3

Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 If $a^2 + 2ab + b^2 = 25$, then $a + b =$ .....

ⓐ -5 ⓑ 5 ⓒ ± 5 ⓓ 6

2 If $2x^2 - 5x + a = (2x - 3)(x - 1)$, then $a =$ .....

ⓐ 2 ⓑ 3 ⓒ -3 ⓓ 5

3 If $(x + y)^2 = 36$, $xy = 9$, then $x^2 + y^2 =$ .....

ⓐ 4 ⓑ 27 ⓒ 18 ⓓ 45

2 Use factorization to get the value of each of the following : (2 marks)

(a) $(87)^2 + 2 \times 13 \times 87 + (13)^2$

(b) $(78)^2 - (77)^2$

Test 4

Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 If $x + y = 4$, $x - y = 2$, then $x^2 - y^2 =$ .....

ⓐ 2 ⓑ 4 ⓒ 6 ⓓ 8

2 If $(x + 8)$ is a factor of the expression : $x^2 + 6x - 16$, then the other factor is .....

ⓐ $x - 2$ ⓑ $x - 4$ ⓒ $x + 2$ ⓓ $x + 4$

3 If the expression : $x^2 + 14x + b$ is a perfect square , then $b =$ .....

ⓐ 2 ⓑ 7 ⓒ 14 ⓓ 49

2 The area of a rectangle is $(2x^2 + 19x + 35)$ cm.^{2} (2 marks)

Find two possible dimensions of the rectangle in terms of x , then find its perimeter as $x = 3$

Test 5

Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 If $a^2 - b^2 = 20$, $a + b = 5$, then $a^2 - 2ab + b^2 =$ .....

ⓐ 4 ⓑ 5 ⓒ 20 ⓓ 16

2 If the expression : $x^2 + bx - 10$ can be factorized , then b may be equal to .....

ⓐ 3 ⓑ 2 ⓒ 1 ⓓ -1

3 If $x^3 + 27 = (x + 3)(x^2 + k + 9)$, then k = ...

ⓐ $-6x$ ⓑ $-3x$ ⓒ $3x$ ⓓ $6x$

2 Factorize each of the following : (2 marks)

(a) $3x^2 - 15x + 12$

(b) $\frac{1}{2}x^3 - 4$

Test 1

Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 If the area of the triangle is 24 cm^2 and its height is 8 cm. , then the length of the corresponding base equals .....

ⓐ 16 cm. ⓑ 6 cm. ⓒ 3 cm. ⓓ 2 cm.

2 If the lengths of two adjacent sides of a parallelogram are 8 cm. and 10 cm. and its greater height is 5 cm. , then its area = ...

ⓐ 80 cm^2 ⓑ 50 cm^2 ⓒ 40 cm^2 ⓓ 18 cm^2

3 The median of the triangle divides its surface into two triangles .....

ⓐ congruent. ⓑ equal in area.

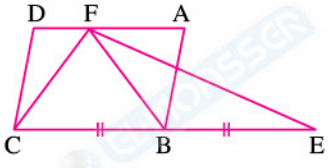
ⓒ equal in perimeter. ⓓ similar.

2 In the opposite figure : (2 marks)

ABCD is a parallelogram

, $E \in \overrightarrow{CB}$, where BC = BE

Prove that : The area of Δ EFC = The area of $\square$ ABCD



Test 2

Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 The ratio between the area of the triangle and the area of the parallelogram whose base is common and are included between two parallel straight lines = ...

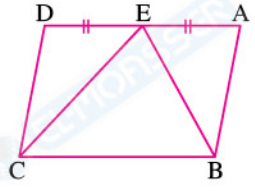
(a) 1 : 2 (b) 1 : 3 (c) 2 : 1 (d) 2 : 3

2 ABC is a triangle , $\overline{AD}$ is a median , then the area of Δ ABC = ...

(a) the area of Δ ABD (b) the area of Δ ACD

(c) 2 the area of Δ ABD (d) 3 the area of Δ ACD

3 **In the opposite figure :**



The area of the parallelogram ABCD = 24 cm^2

, then the area of Δ ABE = ... cm^2

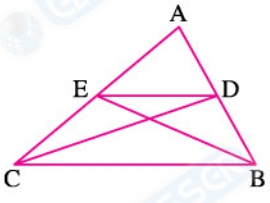
(a) 24 (b) 12

(c) 8 (d) 6

2 In the opposite figure : (2 marks)

If area of Δ ADC = area of Δ AEB

Prove that : $\overline{DE}$ // $\overline{BC}$



Test 3

Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 ABCD is a parallelogram with area 100 cm^2 and $E \in \overline{AD}$, then the area of Δ EBC = ...

ⓐ 50 ⓑ 60 ⓒ 100 ⓓ 200

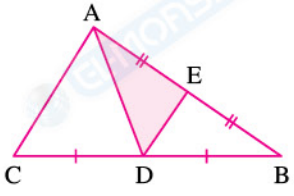
2 If ABCD is a parallelogram in which , AB = 5 cm. , BC = 10 cm. and its smaller height is 4 cm. , then its greater height equals .....

ⓐ 2 cm. ⓑ 4 cm.

ⓒ 8 cm. ⓓ 10 cm.

3 **In the opposite figure :**

If the area of Δ ABC = 24 cm^2 , then the area of Δ ADE = ...



ⓐ 6 cm^2 ⓑ 12 cm^2

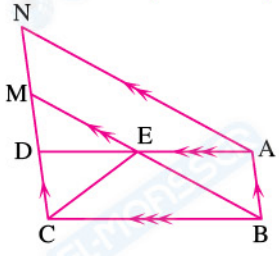
ⓒ 24 cm^2 ⓓ 48 cm^2

2 In the opposite figure : (2 marks)

ABCD and ABMN are two parallelograms.

Prove that :

The area of Δ EBC = $\frac{1}{2}$ the area of $\square$ ABMN



Test 4

Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 The triangle whose base length 7 cm. and its area is 28 $cm.^2$, then the corresponding height equals .....

(a) 2 (b) 4 (c) 6 (d) 8

2 If the area of ▱ ABCD = 48 cm^2 , then the area of Δ ABC = ...

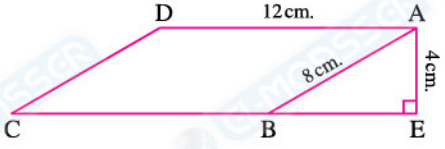
(a) 96 (b) 48

(c) 24 (d) 12

3 **In the opposite figure :**

ABCD is a parallelogram

, then area of ▱ ABCD = ...



(a) 32 (b) 16

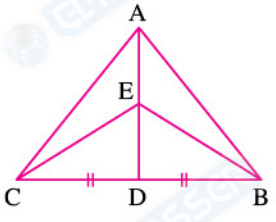
(c) 48 (d) 24

2 In the opposite figure : (2 marks)

D is midpoint of $\overline{BC}$, $E \in \overline{AD}$

Prove that :

The area of Δ ABE = the area of Δ ACE



Test 5

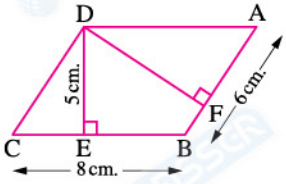
Total mark 5

1 Choose the correct answer from those given : (3 marks)

1 In the opposite figure :

ABCD is a parallelogram

, then DF = ...



(a) 40 cm. (b) $6\frac{2}{3}$ cm.

(c) 6 cm. (d) 30 cm.

2 The area of a right-angled triangle in which the lengths of the sides of the right angle are 8 cm. and 13 cm. equals .....

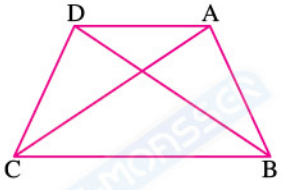
(a) 104 cm^2 (b) 52 cm^2

(c) 26 cm^2 (d) 202 cm^2

3 In the opposite figure :

If the area of Δ ABC = The area of Δ DBC

, then .....



(a) $\overline{AB}$ // $\overline{CD}$ (b) AB = CD

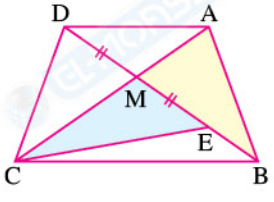
(c) $\overline{AD}$ // $\overline{BC}$ (d) AD = BC

2 In the opposite figure : (2 marks)

ME = MD

The area of Δ AMB = the area of Δ CME

Prove that : $\overline{AD}$ // $\overline{BC}$



Answers of Test 1

1 1 (c) 2 (a) 3 (b)

2 **(a)** $2x(x^2 - 4) = 2x(x - 2)(x + 2)$

(b) $(x + 2)(x^2 - 2x + 4)$

Answers of Test 2

1 1 (b) 2 (b) 3 (c)

2 **(a)** $(2x - 1)(x - 2)$

(b) $(2x - 5y)(2x + 5y)$

Answers of Test 3

1 1 (c) 2 (b) 3 (c)

2 **(a)** $(87 + 13)^2 = 100^2 = 10000$

(b) $(78 - 77)(78 + 77) = 1 \times 155 = 155$

Answers of Test 4

1 1 (d) 2 (a) 3 (d)

2 $\because 2x^2 + 19x + 35 = (2x + 5)(x + 7)$

$\therefore$ The two dimensions are $(2x + 5)$ cm. $(x + 7)$ cm.

when $x = 3$, then the two dimensions are 11 cm. and 10 cm.

, the perimeter = $2(11 + 10) = 42$ cm.

Answers of Test 5

1 1 (d) 2 (a) 3 (b)

2 **(a)** $3(x^2 - 5x + 4) = 3(x - 4)(x - 1)$

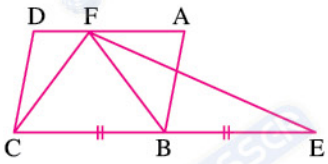
(b) $\frac{1}{2}(x^3 - 8) = \frac{1}{2}(x - 2)(x^2 + 2x + 4)$

Answers of Test 1

1 1 (b) 2 (c) 3 (b)

2 ∵ Δ BFC , ▱ ABCD have the common base $\overline{BC}$

, ∵ F ∈ $\overline{AD}$



∴ The area of Δ BFC = $\frac{1}{2}$ the area of ▱ ABCD(1)

∵ $\overline{FB}$ is a median in Δ FEC

∴ The area of Δ BFC = $\frac{1}{2}$ the area of Δ FEC (2)

From (1) and (2) :

∴ The area of Δ FEC = The area of ▱ ABCD (Q.E.D.)

Answers of Test 2

1 1 (a) 2 (c) 3 (d)

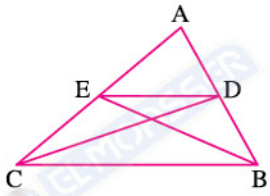
2 ∵ The area of Δ ABE = the area of Δ ACD

and subtracting the area of Δ ADE from both sides.

∴ the area of Δ DEB = the area of Δ DEC

but they have the common base $\overline{DE}$ and on one side of it.

∴ $\overline{DE}$ // $\overline{BC}$



(Q.E.D.)

Answers of Test 3

1 1 (a) 2 (c) 3 (a)

2 ∵ Δ EBC has the common base $\overline{BC}$ with the ▱ ABCD , E ∈ $\overline{AD}$

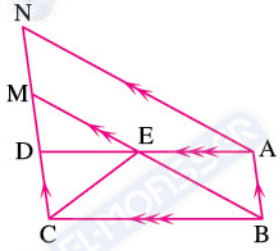
∴ The area of Δ EBC = $\frac{1}{2}$ the area of ▱ ABCD

, ∵ ▱ ABCD , ▱ ABMN have the common base $\overline{AB}$

and $\overleftrightarrow{AB}$ // $\overleftrightarrow{CN}$

∴ The area of ▱ ABCD = the area of ▱ ABMN

∴ The area of Δ EBC = $\frac{1}{2}$ the area of ▱ ABMN



(Q. E. D.)

Answers of Test 4

1 1 (d) 2 (c) 3 (c)

2 In Δ ABC :

∵ $\overline{AD}$ is a median

∴ area of Δ ABD = area of Δ ACD (1)

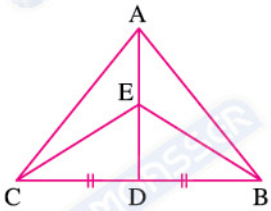
, in Δ BEC

∵ $\overline{ED}$ is a median

∴ Area of Δ EBD = area of Δ ECD (2)

by subtracting (2) from (1)

∴ area of Δ ABE = area of Δ ACE (Q.E.D.)



Answers of Test 5

1 1 (b) 2 (b) 3 (c)

2 ∵ $\overline{MC}$ is a median in Δ DEC

∴ The area of Δ CME = the area of Δ CMD

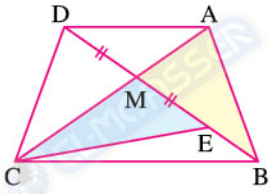
, ∵ the area of Δ CME = the area of Δ AMB

∴ The area of Δ AMB = the area of Δ CMD

Adding the area of Δ AMD to both sides.

∴ The area of Δ ABD = the area of Δ ACD and they have the common base $\overline{AD}$ and on one side of it.

∴ $\overline{AD}$ // $\overline{BC}$ (Q.E.D.)



Accumulative test 1 on lesson 1 – unit 1

1 Choose the correct answer from the given ones :

1 If the expression : $x^2 + k\,x + 2$ can be factorized , then k = ...

(a) – 2 (b) 2 (c) 5 (d) 3

2 The expression : $x^2 + 4\,x + k$ can be factorized if k = ...

(a) 5 (b) 6 (c) 2 (d) 3

3 If the expression : $x^2 - c\,x + 12$ can be factorized , then c may be equal to .....

(a) – 1 (b) 4 (c) 7 (d) 10

4 The expression : $x^2 + 6\,x + k$ can be factorized , when k = ...

(a) 4 (b) 5 (c) 6 (d) 7

5 If $(x - 1)$ is a factor of the expression : $x^2 - 4\,x + 3$, then the other factor is .....

(a) $x + 3$ (b) $x - 3$ (c) $x + 1$ (d) $x - 4$

6 If $(x + 8)$ is a factor of the expression : $x^2 + 6\,x - 16$, then the other factor is .....

(a) $x - 2$ (b) $x - 4$ (c) $x + 2$ (d) $x + 4$

7 If $(x + 3)$ is a factor of the expression : $x^2 - 2\,x - 15$, then the other factor is .....

(a) $x - 5$ (b) $x + 3$ (c) $x + 1$ (d) $x + 5$

8 If $x^2 + k\,x - 6 = (x + 3)\,(x - 2)$, then k = ...

(a) – 1 (b) 1 (c) 2 (d) 3

---

2 Factorize each of the following completely :

1 $x^2 - 5\,x - 36$

2 $x^2 + 2\,x - 35$

3 $x^2 + 4\,x - 21$

4 $x^2 + 8\,x + 12$

5 $3\,x^2 - 15\,x + 12$

6 $(c + d)^2 + 5\,(c + d) + 6$

Accumulative test 2 till lesson 2 – unit 1

1 Choose the correct answer from the given ones :

1 If $(5x - 7)$ is a factor of the expression : $5x^2 - 2x - 7$, then the other factor is .....

(a) $x - 1$ (b) $x - 5$ (c) $x + 1$ (d) x

2 If the expression : $x^2 + a x - 5$ can be factorized , then a = ...

(a) 1 (b) 4 (c) 5 (d) 6

3 If $(2a - 5)(3a - 2) = 6a^2 + k a + 10$, then k = ...

(a) 15 (b) 19 (c) – 19 (d) 4

4 The expression : $x^2 + 7x + b$ can be factorized , if b = ...

(a) 3 (b) 4 (c) 6 (d) 7

5 If $x^2 + k x - 21 = (x - 3)(x + 7)$, then k = ...

(a) – 4 (b) 4 (c) 8 (d) 20

6 $2x^2 + 5x + 3 = (..... + 3)(x + 1)$

(a) x (b) $2x$ (c) $3x$ (d) $5x$

7 If $2x^2 + c x - 3 = (2x + 3)(x - 1)$, then c = ...

(a) 3 (b) 1 (c) – 2 (d) 4

8 If $(x - 2)$ is a factor of the expression : $x^2 - 5x + 6$, then the other factor is .....

(a) $x + 3$ (b) $x + 4$ (c) $x - 3$ (d) $x - 4$

---

2 Factorize each of the following completely :

1 $2x^2 + 3x + 1$

2 $12x^2 - 7x + 1$

3 $6x^2 + 20x + 16$

4 $8x^2 - 2xy - y^2$

5 $x^2 + x - 12$

6 $2x^3 - 5x^2 + 2x$

Accumulative test 3 till lesson 3 – unit 1

1 Choose the correct answer from the given ones :

1 The trinomial : $x^2 + k\,x + 49$ is a perfect square , when k = ...

(a) ± 7 (b) 7 (c) 49 (d) ± 14

2 If $x^2 + 4\,x + k$ is a perfect square , then k = ...

(a) 1 (b) 2 (c) 3 (d) 4

3 If $(x + y)^2 = 42$, $x^2 + y^2 = 12$, then $x\,y$ = ...

(a) 15 (b) 30 (c) 22 (d) 54

4 The expression : $k\,x^2 + 12\,x + 9$ is a perfect square , if k = ...

(a) 3 (b) 4 (c) 9 (d) 16

5 If $a^2 + b^2 = 11$, $a\,b = 5$, then $a - b$ = ...

(a) 1 (b) – 1 (c) ± 1 (d) ± 4

6 If $x^2 + y^2 = 7$, $x\,y = 3$, then $(x - y)^2$ = ...

(a) – 1 (b) 1 (c) ± 1 (d) 10

7 If $a^2 + 2\,a\,b + b^2 = 25$, then $a + b$ = ...

(a) $\pm\frac{25}{4}$ (b) ± 10 (c) ± 5 (d) $\pm\frac{25}{2}$

8 The expression : $x^2 - 2\,x + c$ can be factorized , when c = ...

(a) – 3 (b) 4 (c) 5 (d) 6

9 $x^2 - 2\,x + 1$ = ...

(a) $(x - 1)^2$ (b) $(x - 1)\,(x + 1)$ (c) $(x + 1)^2$ (d) $2\,x^2$

---

2 Factorize each of the following completely :

1 $x^2 + 4\,x\,y + 4\,y^2$

2 $3\,y^2 + 7\,y - 6$

3 $25\,a^4 - 10\,a^2 + 1$

---

3 Use factorization to get the value easily :

$(99)^2 + 2 \times 99 + 1$

Accumulative test 4 till lesson 4 – unit 1

1 Choose the correct answer from the given ones :

1 If $x + y = 4$, $x - y = 2$, then $x^2 - y^2 =$ .....

(a) 15 (b) 8 (c) 2 (d) – 15

2 If $x - y = 4$, $x + y = 5$, then $y^2 - x^2 =$ .....

(a) 9 (b) – 1 (c) – 20 (d) 20

3 If $x^2 - y^2 = 35$, $x - y = 5$, then $x + y =$ .....

(a) 7 (b) 40 (c) 30 (d) 5

4 If $x + 2y = 3$, $x^2 - 4y^2 = 21$, then $x - 2y =$ .....

(a) 14 (b) 9 (c) 7 (d) 6

5 If the expression : $16x^2 + 24x + k$ is a perfect square , then k = ...

(a) 3 (b) 9 (c) 12 (d) 16

6 The expression : $x^2 + 5x + m$ can be factorized , if m = ...

(a) 12 (b) 7 (c) – 14 (d) – 2

7 If $(x + y)^2 = 64$, $xy = 15$, then $x^2 + y^2 =$ .....

(a) 8 (b) 34 (c) – 34 (d) 79

8 $(x + 2)^2 =$ .....

(a) $x^2 + 4$ (b) $x^2 - 4$ (c) $x^2 + 2x + 4$ (d) $x^2 + 4x + 4$

2 Factorize each of the following completely :

1 $16x^2 - 49$

2 $4x^2 - 9$

3 $3x^2 + 7x - 6$

4 $x^3 - x$

5 $(x + 3)^2 - 25$

6 $8x^2 - 2xy - y^2$

Accumulative test 5 till lesson 5 – unit 1

1 Choose the correct answer from the given ones :

1 $(x+1)(x^2-x+1) =$ .....

(a) x^3-1 (b) x^3+1 (c) $(x-1)^3$ (d) $(x+1)^3$

2 If the expression : x^2-6x-m is a perfect square , then m = ...

(a) -9 (b) 1 (c) 3 (d) 7

3 If $x^3+27=(x+k)(x^2-3x+m)$, then $k \times m =$ .....

(a) 27 (b) 3 (c) 9 (d) -9

4 If $x^3+y^3=28$, $x+y=2$, then $x^2-xy+y^2=$ .....

(a) 48 (b) 14 (c) 2 (d) 7

5 If $(2a-5)(3a-2)=6a^2+ka+10$, then k = ...

(a) 15 (b) 19 (c) -19 (d) 4

6 If $a^2-b^2=15$, $a+b=5$, then $a-b=$ .....

(a) 15 (b) 6 (c) 5 (d) 3

7 If $a^2+2ab+b^2=25$, then $a+b=$ .....

(a) -5 (b) 5 (c) ± 5 (d) 25

8 If $x^3-y^3=24$, $x^2+xy+y^2=8$, then $x-y=$ .....

(a) 4 (b) 6 (c) 3 (d) 12

---

2 Factorize each of the following completely :

1 x^4+8x

2 $2x^5-54x^2$

3 $27x^3+125$

4 x^3+8y^3

5 x^2+7x-8

6 $2x^2-3x-2$

Accumulative test 1 on lesson 1 – unit 4

1 Choose the correct answer from those given :

1 If the base length of a parallelogram is 7 cm. and the corresponding height is 5 cm. , then its area equals ..... cm^2

(a) 12 (b) 35 (c) 70 (d) 100

2 If the lengths of two adjacent sides of a parallelogram are 8 cm. , 6 cm. and its greater height is 12 cm. , then its area equals ..... cm^2

(a) 72 (b) 84 (c) 96 (d) 168

3 If the area of a parallelogram is 48 cm^2 and its base length is 12 cm. , then the corresponding height to this base is ..... cm.

(a) 4 (b) 2 (c) 5 (d) 6

4 If the lengths of two adjacent sides of a parallelogram are 9 cm. , 6 cm. and its smaller height is 4 cm. , then its greater height is ..... cm.

(a) 36 (b) 24 (c) 12 (d) 6

---

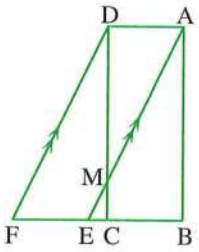
2 [a] In the opposite figure :

ABCD is a rectangle

, $\overline{AE} // \overline{DF}$, $C \in \overline{BF}$, $E \in \overline{BF}$

Prove that :

The area of the figure ABCM = The area of the figure DMEF



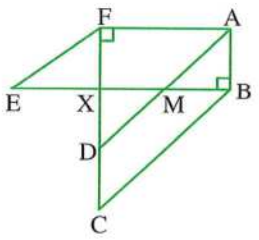
[b] In the opposite figure :

ABXF is a rectangle

, ABCD and AMEF are two parallelograms

Prove that :

The area of ▱ ABCD = The area of ▱ AMEF



---

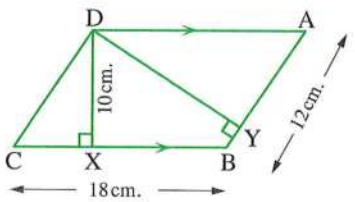
3 [a] In the opposite figure :

ABCD is a parallelogram , AB = 12 cm.

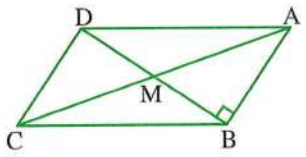
, BC = 18 cm. , DX = 10 cm.

Find : 1 The area of the parallelogram.

2 The length of $\overline{DY}$



[b] In the opposite figure :



ABCD is a parallelogram , AC = 20 cm.

, BD = 12 cm. , m (∠ ABD) = 90° , AB = 8 cm.

Find the area of the parallelogram ABCD

Accumulative test 2 till lesson 2 – unit 4

1 Choose the correct answer from those given :

1 If the area of a triangle is 24 cm^2 and its height is 8 cm. , then the length of the corresponding base to this height is ..... cm.

(a) 16 (b) 6 (c) 3 (d) 2

2 If the area of a triangle is 15 cm^2 and its base length is 5 cm. , then the corresponding height is ..... cm.

(a) 5 (b) 3 (c) 10 (d) 6

3 The area of the triangle is ..... the area of the parallelogram having a common base and its vertex lies on the straight line parallel to this base.

(a) equal to (b) half (c) twice (d) quarter

4 The area of the parallelogram in which the lengths of two adjacent sides are 7 cm. and 5 cm. and its smaller height is 4 cm. equals ..... cm^2

(a) 35 (b) 25 (c) 28 (d) 49

5 The area of the rectangle whose dimensions are 3 cm. and 8 cm. ..... the area of the triangle whose base length is 8 cm. and its corresponding height is 6 cm.

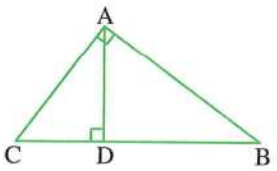
(a) > (b) < (c) = (d) ≠

6 ABCD is a parallelogram whose area is 60 cm^2 , then the area of Δ ABC equals ..... cm^2

(a) 10 (b) 15 (c) 30 (d) 60

7 **In the opposite figure :**

AB × ..... = BC × AD



(a) AC (b) BD

(c) DC (d) BC

---

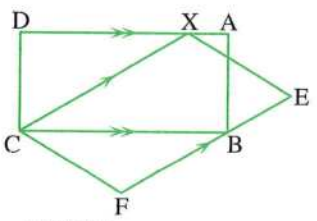
2 [a] In the opposite figure :

ABCD is a rectangle

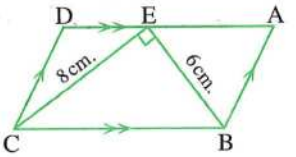
, XEFC is a parallelogram.

Prove that :

The area of the rectangle ABCD = The area of the parallelogram XEFC



[b] In the opposite figure :



ABCD is a parallelogram , $E \in \overline{AD}$

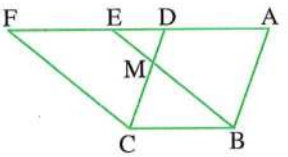
, EB = 6 cm. , EC = 8 cm.

Find : [1] The area of Δ EBC

[2] The area of the parallelogram ABCD

---

3 **[a] In the opposite figure :**



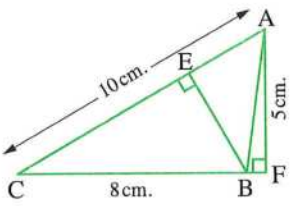
ABCD and EBCF are two parallelograms

, $D \in \overline{AF}$, $E \in \overline{AF}$

, $\overline{CD} \cap \overline{BE} = \{M\}$

Prove that : The area of the figure ABMD = The area of the figure EMCF

[b] In the opposite figure :



$\overline{AF} \perp \overrightarrow{CB}$, $\overline{BE} \perp \overline{AC}$, AC = 10 cm.

, BC = 8 cm. , AF = 5 cm.

Calculate : The area of Δ ABC

And find : The length of $\overline{BE}$

Accumulative test 3 till lesson 3 – unit 4

1 **Choose the correct answer from those given :**

1 ABCD is a parallelogram whose area is 80 cm.^{2} and E $\in \overline{AD}$, then the area of Δ EBC equals ..... cm.^{2}

(a) 40 (b) 60 (c) 80 (d) 160

2 ABC is a triangle , if $\overline{AD}$ is a median , then the area of Δ ABC = ...

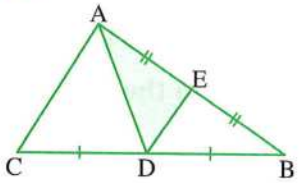
(a) the area of Δ ABD (b) the area of Δ ACD

(c) 2 the area of Δ ABD (d) 3 the area of Δ ACD

3 The triangle whose base length is 7 cm. and its area is 28 cm.^{2} , the corresponding height equals ..... cm.

(a) 2 (b) 4 (c) 6 (d) 8

4 **In the opposite figure :**



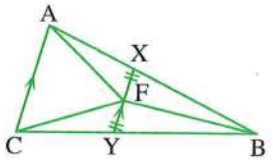
The area of Δ AED = ... The area of Δ ABC

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) $\frac{1}{4}$ (d) $\frac{1}{8}$

---

2 **[a] In the opposite figure :**

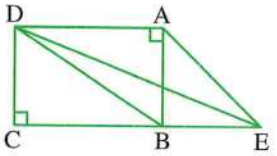


$\overline{AC}$ // $\overline{XY}$

, F is the midpoint of $\overline{XY}$

Prove that : The area of Δ ABF = The area of Δ CBF

[b] In the opposite figure :

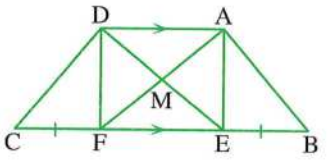


ABCD is a rectangle , E $\in \overrightarrow{CB}$

Prove that : The area of Δ DBC = The area of Δ ADE

---

3 **[a] In the opposite figure :**



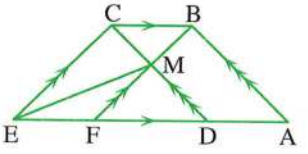
$\overline{AD}$ // $\overline{BC}$, E $\in \overline{BC}$, F $\in \overline{BC}$

where BE = CF , $\overline{AF} \cap \overline{ED} = \{M\}$

Prove that : 1 The area of Δ AME = The area of Δ DMF

2 The area of the figure ABEM = The area of the figure DCFM

[b] In the opposite figure :



ABCD and BCEF are two parallelograms.

Prove that :

The area of Δ CEM = $\frac{1}{2}$ The area of the parallelogram ABCD

Accumulative test 4 till lesson 4 – unit 4

1 Choose the correct answer from those given :

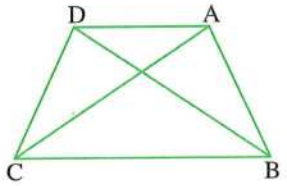
1 The ratio between the area of the parallelogram and the area of the triangle whose base is common and are included between two parallel straight lines equals .....

(a) 2 : 1 (b) 3 : 1 (c) 1 : 2 (d) 1 : 3

2 The median of the triangle divides its surface into two triangles .....

(a) congruent. (b) similar. (c) equal in area. (d) equal in perimeter.

3 **In the opposite figure :**



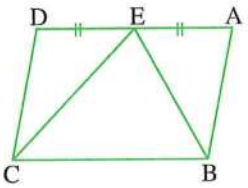
If the area of Δ ABC = The area of Δ DBC

, then .....

(a) $\overline{AB}$ // $\overline{CD}$ (b) AB = CD

(c) $\overline{AD}$ // $\overline{BC}$ (d) AD = BC

4 **In the opposite figure :**



The area of the parallelogram ABCD = 24 cm^2

, then the area of Δ ABE = ... cm^2

(a) 24 (b) 12 (c) 8 (d) 6

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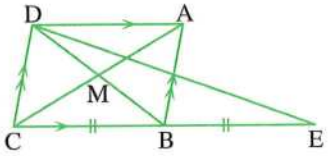
2 [a] **In the opposite figure :**

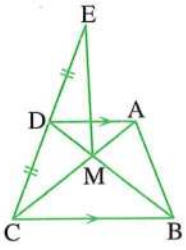


ABCD is a parallelogram whose diagonals intersect at M

, B is the midpoint of $\overline{CE}$

Prove that : The area of Δ EBD = The area of Δ ACD

[b] **In the opposite figure :**



$\overline{AD}$ // $\overline{BC}$

, D is the midpoint of $\overline{CE}$

Prove that :

The area of Δ AMB = The area of Δ EMD

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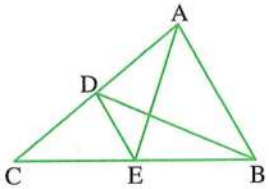
3 [a] **In the opposite figure :**



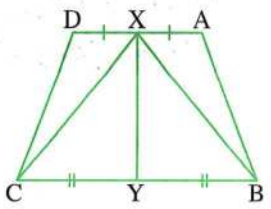
ABC is a triangle , D ∈ $\overline{AC}$

, E ∈ $\overline{BC}$

where the area of Δ AEC = the area of Δ BDC

Prove that : $\overline{DE}$ // $\overline{AB}$

[b] In the opposite figure :



ABCD is a quadrilateral , X is the midpoint of $\overline{AD}$, Y is the midpoint of $\overline{BC}$

where the area of the figure

ABYX = the area of the figure DCYX

Prove that : $\overline{AD} \parallel \overline{BC}$

Date: …..... /……... /…....

Unit 1: Factroization
Lesson 1: Factroizing the quadratic Trinonial

$$ax^2 + bx^2 + c$$

Board Summary

The H.C.F of 3 and 6 is 3
The H.C.F of x , x^2 and is x

Example: <u>Factorize completely:</u>

1- $x^2 - 5x + 6 =$

2- $x^2 + 4x - 12$

3- $x^3 - 6x^2 + 8x^2$

4- $2x^2 - 3xy - 5y^2$

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Date: ……. /……. /…….

Evaluation

1- Complete:

(1) $x^2 - 8x + 15 = (\quad)(\quad)$
(2) $x^2 - 7x + 12 = (\quad)(\quad)$
(3) $x^3 - 5x^2 - 14x = (\quad)(\quad)$
(4) $x^2 + \ldots\ldots + 35 = (x + \ldots\ldots)(\ldots\ldots + 5)$
(5) $x^2 - 11x + 18 = (\quad)(\quad)$

2- Factorize completely:

(1) $a^2 - 3ab + 2b^2$ =

(2) $x^2y - 4xy - 12y$ =

(3) $2x^2 - 14x + 24$ =

3- If $x^2 + kx + 5$ can be factorized then find the possible values of k

4- If $x + y = 5$ and $x + 2y = 8$ then

Find the value of $x^2 + 3xy + 2y^2$.

Date: ……. /……. /…….

Homework

1- Complete:

(a) $x^2 - 3x - 10 =$ ( )( )

(b) $x^2 + 7x + 10 =$ ( ) ( )

(c) $x^2y - xy - 12y =$ ( )( )

2- Factorize completely:

(1) $x^2 + 7x - 18 =$

(2) $x^3 - 5x^2 + 6x =$

(3) $x^3 - 2x^2 - 15x =$

3- Complete:

(1) If $x - 2$ is a factor of the expression $x^2 - 7x + 10$ then the other factor is…

(2) If the algebraic expression $x^2 + kx + 2$ can be factorized then k=…….

Remembe

***Factorizing an algebraic expression means to write it as a product of two factors or more.**
*** When we factorize a quadratic trinomial we simplify the expression and order it descendingly according to the power of x Then we factorize the expression which inside the brackets.**

Date: ……. /……. /…….

Unit 1: Factroization
Lesson2: Factroizing the quadratic Trinonial

$a\,x^2 + b\,x^2 + c$ $\quad a \neq \pm 1$

Board Summary

Factorize:

$5\,x^2 - 2\,x - 7 = (5\,x - \cdots \ldots \ldots)(x + \cdots \ldots \ldots \ldots \ldots)$

$3\,x^2 + 7\,x - 6 = (3\,x - \cdots \ldots \ldots)(\ldots \ldots \ldots + \cdots \ldots \ldots \ldots \ldots)$

$10\,a^2 + 11ab - 18\,b^2$

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Date: ……. /……. /…….

Evaluation

1- Complete:

(1) $2x^2 - 10x + 15 =$ ( ) ( )

(2) $3x^2 + 10x + 8 =$ ( ) ( )

(3) $6x^2 - 11x - 10 =$ ( ) ( )

2- Factorize completely:

(1) $2x^2 - 14x + 24$

(2) $2x^2 - 3x - 2$

(3) $3x^2 + 5x + 2$

3- If($2x - 7$) is one of the factors of the expression ($6x^2 - 19x - 7$) Find the other factor.

4- If $x + y = 5$ and $x + 2y = 8$ then

Find the value of $x^2 + 3xy + 2y^2$.

Date: ……. /……. /…….

Homework

1- Complete:

(a) $3x^2 - 20x - 7y^2 = (\quad)(\quad)$

(b) $5x^2 - 7x - 6 = (\quad)(\quad)$

(c) $5x^2 - 11x - 12 = (\quad)(\quad)$

(d) $3x^2 + 7x + 2 = (\quad)(\quad)$

2- Factorize completely:

(1) $3x^2 - 5x + 2 =$ ……

(2) $6x^2 + x - 15 =$ ……..

(3) If $x + y = 3$ and $2x - y = 9$

, then the value of $2x^2 + xy - y^2 =$ …….

Date: …..... /..…... /…....

Remember

***Factorizing an algebraic expression means to write it as a product of two factors or more.**
*** When we factorize a quadratic trinomial we simplify the expression and order it disceningly according to the power of x Then we factorize the expression which inside the brackets.**

Date: …..... /……... /…....

Unit 1: Factroization

Lesson3: Factroizing the perfect square trinonial

Board Summary

1- Which of the following is a perfect square:

(1) $9x^2 + 30xy + 25y^2$
(2) $4x^2 + 9xy + 9y^2$
(3) $x^2 + 4xy - 4y^2$
(4) $x^2 + y^2$

2- Choose the correct answer:

(1)If $x^2 + kx + 16$ is a perfect square then k = ……. (4 , ± 4 , 8 , ± 8)
(2)If $x^2 + 14x + c$ is a perfect square then c = ……... (2 , 7 , 14 , 49).
(3)If $a^2 + 2ab + b^2 = 25$ then a + b = …….. (5 , -5 , ± 5 , 50).

3- Factorize completely:

1) $4x^2 + 12x + 9$
2) $x^2 - 10xy + 25y^2$

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Date: ……. /……. /…….

Evaluation

1- Complete

(1) $x^2 - 8x + 16 = (\quad)^2$

(2) $x^2 + 18x + 81 = (\quad)^2$

(3) $4x^2 + 20x + 25 = (\quad)^2$

2- Factorize completely:

(1) $y^2 - 22y + 121$

(2) $4a^2 - 36ab + 81b^2$

(3) $9x^2 - 24x + 16$

(4) $x^2 - 4xy + 4y^2$

3- Find the value of k to get a perfect square:

(1) $x^2 + kx + 1$
(2) $kx^2 - 8x + 16$
(3) $25x^2 - 60x + k$
(4) $25a^2 + 2a + k$

4- Using factorization find the value of:

(1) $(3.7)^2 - 2 \times 3.7 \times 2.7 + (2.7)^2$

(2) If $x + \frac{1}{x} = 5$ find the value of $x^2 + \frac{1}{x^2}$

6- Choose:

(1) If $x^2 + kx + 25$ is a perfect square then k = (5 , ±5 , 10 , ±10)

(2) If $9x^2 + 24x + c$ is a perfect square then c = (4 , 8 , 64 , 16)

Date: ……. /……. /…….

Homework

1- Complete

(a) $x^2 - 4x + 4 = (\quad)^2$

(b) If $x^2 + kx + 49$ is a perfect square then k = ……

(c) A square its side length $= (x^2 + 10x + 25)\ cm^2$

then its side length =… … … cm

(d) If $L + M = 12$ then $l^2 + 2lM + M^2$= ……

Date: ……. /……. /…….

Unit 1: Factroization

Lesson4: Factroizing the difference of two squares

Board Summary

Example: Choose the correct answer:

(1) If $a - b = 2$, $a + b = 8$ then $a^2 - b^2 = \cdots$ (16 , 6 , 4 , 10)

(2) $If\ a^2 - b^2 = 18$, $a - b = 2\ then\ \sqrt{a+b} = \cdots$ (9 , 3 , ± 3 , -3)

Critical thinking:

If $a > b$, $a^2 - 2ab + b^2 = 25$, $a + b = 7$ Find the value of $a^2 - b^2$

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Date: ……. /……. /…….

Evaluation

1- Complete

(1) $x^2 - 100$ =( )( )

(2) $4x^2 - 81$ =( )( )

(3) $4x^2 - 25$ =( )( )

(4) If $x^2 - y^2 = 15$, $x + y = 5$ then $x - y =$ … … ….

(5) If $x^2 + k + 17 = (x - 5)(x + 5)$ then $k =$ … … ….

2- Factorize completely:

(1) $4x^2 - 49$

(2) $9a^2 - 64b^2$

(3) $2x^2 - 18$

(4) $\frac{1}{3}x^2 - 3$

(5) $x^3 - 25x$

3-Choose the correct answer:

(1) If $x^2 - k = (x - 4)(x + 4)$ then $k =$ ---------- (4 , −4 , 16 , −16)

(2) If $a^2 - b^2 = 16$, $(a - b) = 2$ then $(a + b) =$ …. (32 , 14 , 18 , 8)

(3) If $(77)^2 - (23)^2 =$ ---------- (405 , 4500 , 54 , 54000)

Date: ……. /……. /…….

Homework

1- Complete:

(a) $x^2 - 36 = (\quad)(\quad)$

(b) $l^2 - \frac{1}{4} = (\quad)(\quad)$

(c) $If\ (x-3)\ (x+3) = 7\ then\ \ x =$ … … ….

(d) $If\ (x^2 - k) = (x-6)\ (x+6)\ then\ \ k =$ … … ….

2- Factorize completely:

(1) $x^2 - 36$

(2) $(x+2)^2 - 9$

(3) $3x^2 - 75$

3- Factorize completely:

(a) $(85)^2 - (15)^2$

(b) $(6.4)^2 - (3.6)^2$

4- Factorize completely:

$$x^2(a-b) - y^2(a-b)$$

Remember

Factorizing the difference of two squares.

$$(\sqrt{1st} + \sqrt{2nd})\ (\sqrt{1st} - \sqrt{2nd})$$

Date: ……. /……. /…….

Unit 1: Factroization

Lesson 5: Factroizing the sum and difference of two cubes

Board Summary

$(1) x^3 - 1 \quad (2) x^3 + 125$

$(3)\ If\ a^3 - 27 = \ldots\ldots, (a - k)(a^2 + 3a + 9)\ then\ k = \ldots\ldots (3, -3, 9, -9)$

Date: ……. /……. /…….

Evaluation

1- Complete

(1) $x^3 - 1$ =( )( )

(2) $x^3 + 27$ =( )( )

(3) $x^3 + 64$ =( ) ( )

(4) $x^3 - 125$ =( ) ( )

(5) $27\,x^3 + 8$ =( ) ( )

(6) $If\ (x + y) = 3\ ,(x^2 - xy + y^2) = 7\ then\ x^3 + y^3 =$ ----------

(7) $x^3 - a$ =$(x - 2)(x^2 + 2x + 4)\ then\ a =$ ----------

2- Factorize completely:

(1) $y^3 - 27$

(2) $8x^3 - 125$

(3) $7a^3 - 56b^3$

(4) $16x^3y - 54y$

(5) $a^6 - 64b^3$

(6) $x^6 - 1$

(7) $\frac{1}{2}x^3 - 4$

(8) $x^6 + 1$

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Homework

(1)Complete

(1)$x^3 - 216$ =( )( )

(2) $8b^3 + 27$ =( )( )

(3) $If\ \ x^3 + y^3 = 28\ \ ,x^2 - xy + y^2 = 7\ then\ x + y =$ … …

(2)Factorize completely:

(1)$x^3 + 1000$

(2)$3x^3 - 81$

(3)$x^6 - y^6$

(4)$(x + 2)^3 + 8$

(5)$8x^3 + \frac{1}{8}$

*Critical thinking:

$If\ \ a^2 + b^2 = 13\ \ ,\ a + b = 5\ find\ the\ value\ of\ \ a^3 + b^3$

Remember

* $x^3 + y^3 = (x + y)\ (x^2 - xy + y^2)$
* $x^3 - y^3 = (x - y)\ (x^2 + xy + y^2)$

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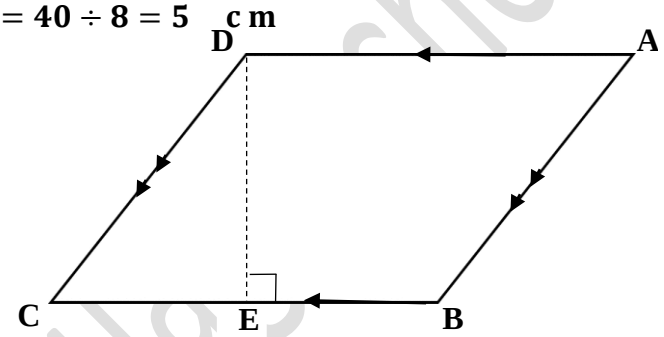
Unit 4: Areas

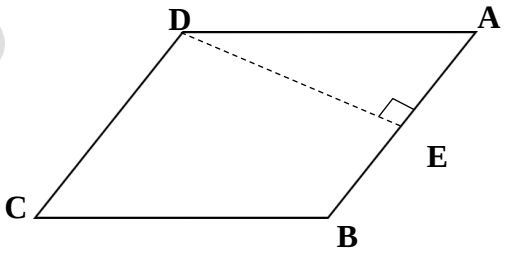
Lesson 1: Equality of areas of two parallelograms

Board Summary

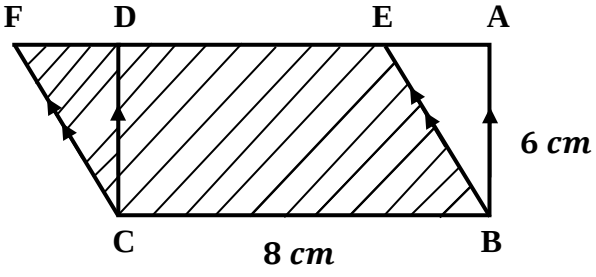
1) In the opposite figure: area of the parallelogram ABCD = 40cm^2 , BC = 8 cm ,
$\overline{DE} \perp \overline{BC}$ then DE = 40 ÷ 8 = 5 c m



2) In the opposite figure area of the parallelogram ABCD = 24cm^2 , BC = 6 cm
$\overline{DE} \perp \overline{AB}$ then AB = ----------cm



3) In the opposite figure: ABCD, is a rectangle , EBCF is a parallelogram, F ∈ $\overrightarrow{AD}$If , AB = 6 cm , BC = 8 cm then area of parallelogram EBCF = ... cm^2



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Evaluation

(1) $If\ ABCD\ and\ AEFD\ are\ two\ parellograms\ , \overline{AE} \cap \overline{CD} = \{X\}\ \ Prove\ that$:
$area\ of\ figure\ ABCX = area\ of\ figure\ DFEX$

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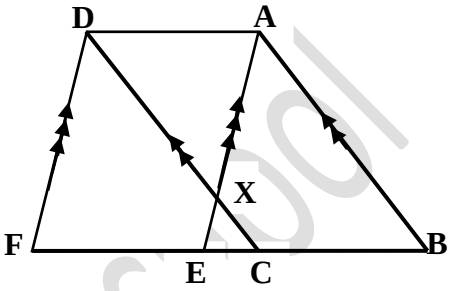

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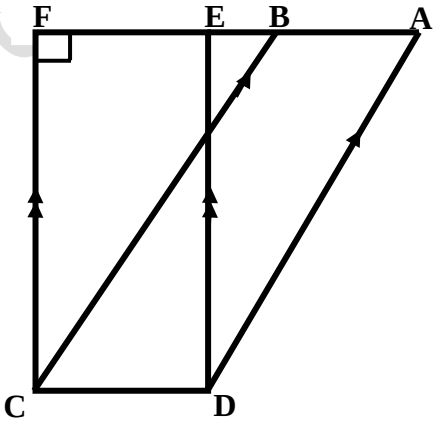
(2) $In\ the\ opposite\ figure$: , $\overline{AB} \parallel \overline{DE}$, $F \in \overrightarrow{AB}$, $the\ figure\ CDEF\ is\ a\ rectangle$,
$\overline{AD} \parallel \overline{BC}$, $Find$ **1)** $The\ area\ of\ figure\ ABCD$
2) $If\ AD$
$= 18\ cm$. $Find\ the\ length\ of\ the\ peripendicular\ line\ segment\ drawn\ from\ B\ to\ \overline{AD}$



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Homework

1- Complete:

(1) *Two paralleograms having a common base and lying between two parallel straight lines are* ----------

(2) *If the area of paralleogram is* $40\ cm^2$ *and its height is* $5\ cm$ *then the length of its corresponding base* = ---------- *cm*

(3) *The area of a paralleogram* = ----------× *its corresponding height*

(4) *If the area of a paralleogram is* $36\ cm^2$ *and the lengths of its bases are* $6\ cm, 4\ cm$ *then the length of its smaller height* = ---------- *cm*

2- Choose the correct answer:

(1) *A paralleogram its two adjacent sides of lengths* $9\ cm$ *and its shorter height is* $4\ cm$ *. then its longer height* = --------~~cm~~ ($6, 12, 24, 36$)

(2) *A paralleogram its base length* = $7\ cm$ *and its area* = $35\ cm^2$ *then its corresponding height* = ----------*cm* ($42, 28, 245, 5$)

(3) *A paralleogram its area is* $24\ cm^2$ *and its length of its two bases are* $4\ cm, 6\ cm$. *then its smaller height* = ---------- *cm* ($2, 3, 4, 6$)

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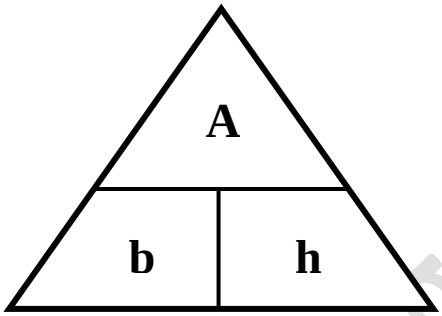
Remember

Area of parallelogram = base length × its corresponding height



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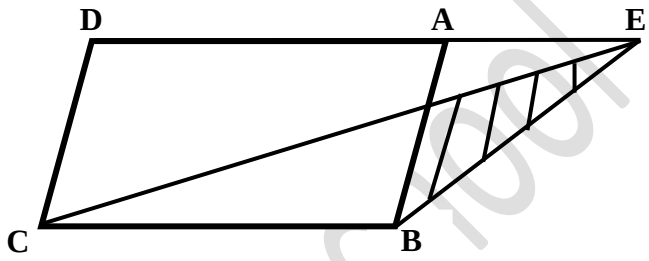
Unit 4: Areas

Lesson 2: Follow equality of areas of two parallelograms

Board Summary



(1)If the area of a parallelogram ABCD is 60 cm^2 , E $\in$ $\overrightarrow{DA}$ *then the area of* $\Delta EBC =$ cm^2

***Solution*: *area of*Δ $EBC = \frac{1}{2}$ *area of* $ABCD = 30\ cm^2$**

(2) *Find the area of triangle of base lenght* 10 *cm and its corresponding heigth is* 8 *cm*

(3)A triangle its surface area $= 60\ cm^2$ and its heigth $= 10$ cm . Find the length of its coressponding base.

(4) *A triangle its area is* 60 cm^2 *and its base length is* 10 *cm Find the corresponding height*

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Evaluation

(1) $ABCD$ *and* $AEFD$ *are two parallelograms*, $\overrightarrow{AD} \cap \overrightarrow{DC} = \{X\}$
prove that area of $\Delta ABX =$ *area of* ΔDFX

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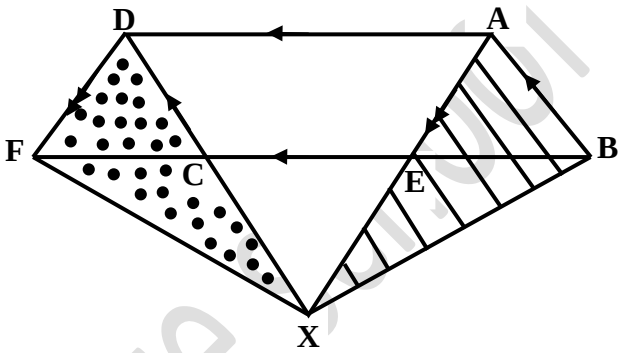

(2) *In the opposite figure*: $ABCD$ *and* $AFXE$ *are two parallelograms*
prove that they are equal in area and if the area of $\Delta ADC = 20\ cm^2$
Find the area of parallelogram $AFXE$

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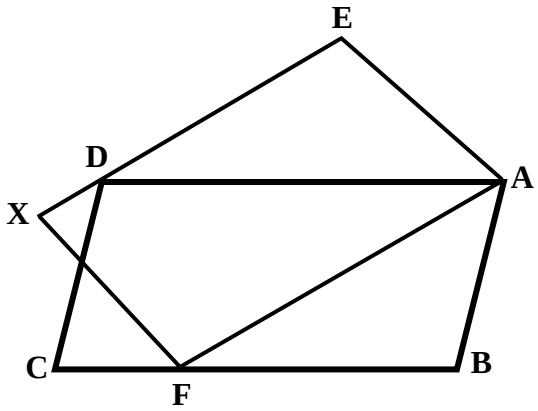

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Homework

1- Complete:

(1) *The ratio between the area of a paralleogram and the area of a triangle which have a common base and lying between two parallel straight lines is* ---------- : ----------

(2) *The area of a right angled triangle whose two sides of the right angle are of lengtht* 6 *cm and* 8 *cm is* ---------- cm^2

(3) *A triangle of area* 32 cm^2 *and its height* = 8 *cm then corresponding base its length* = ---------- *cm*

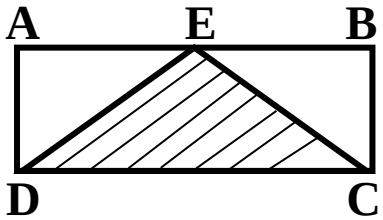
2- Choose the correct answer:

(1) *A triangle of area* 120 cm^2 *and the length of its base is* 15 *cm then its corresponding height.* = ---------- *cm* (8 , 16 , 12 , 24)

(2) *The ratio between the area of a paralleogram and the area of a triangle which having a common base and a commom height* = -----: -----
(2: 1 , 1: 2 , 3: 1 , 1: 3)

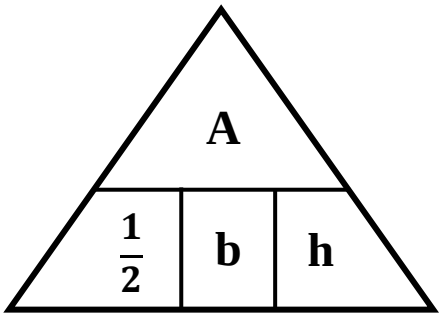
(3) *The area of triangle* = ---------- *the area of the paralleogram with a common base and lying between two paraleel straight lines.*
(*twice* , *third* , *quarter* , *half*)

(4) *In the opposite figure the area of* $\Delta EDC = 7cm^2$
then the area of the rectangle $ABCD$ = ---------- cm^2
(7 , 14 , 3.5 , 49)



Remember

Area of $\Delta = \frac{1}{2} \times b \times h$



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Unit 4: Areas

Lesson 3 : Equality of areas of two triangles

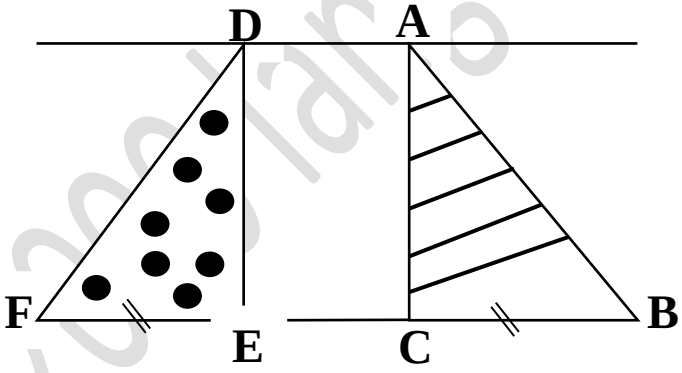
Board Summary

(1) Complete:

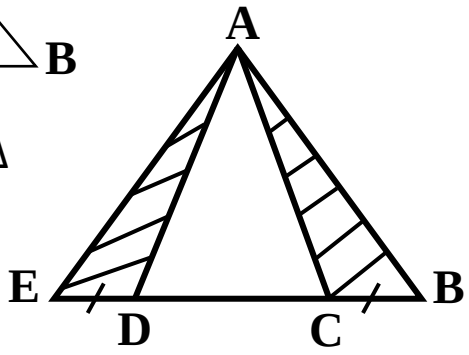
1)***Triangle with equal bases and lying between two parallel straight lines are***

2)***The median of a triangle divides its surface into two triangles equal in area***

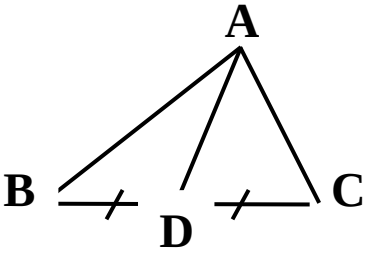
3)***If*** $\overleftrightarrow{AD} \parallel \overleftrightarrow{BF}$ ***,*** $BC = EF$ ***then area of*** ΔABC ***= area of*** Δ



4)***If*** $BC = DE$ ***then area of*** ΔABC ***= area of*** Δ



5) ***In*** ΔABC ***if*** $\overline{AD}$ ***is a median then area of*** ΔADC ***= area of*** Δ



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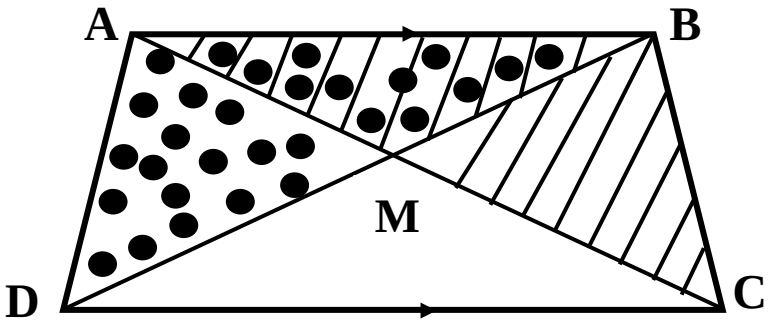
6) *If $\overline{AB} \parallel \overline{CD}$ then area of ΔACB = area of Δ* _____
***area of ΔCBD = area of Δ* _____**



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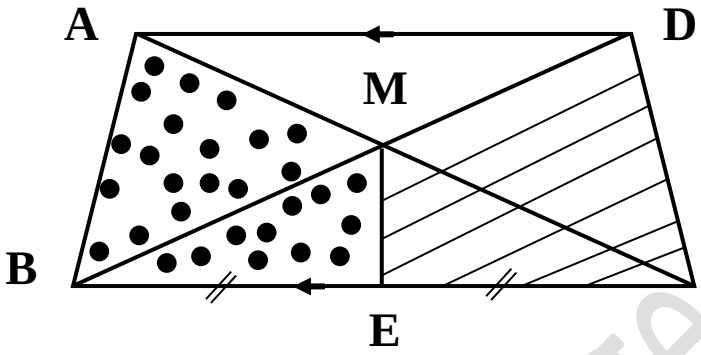
Evaluation

1) $If\ ABCD\ is\ equadrilateral, \overline{AD} \parallel \overline{BC}, E\ is\ a\ mid\ point\ of\ \overline{BC}, \overline{AC} \cap \overline{BD} = \{M\}$
$Prove\ that$:
$area\ of\ the\ figure\ ABEM = area\ of\ the\ figure\ DCEM$



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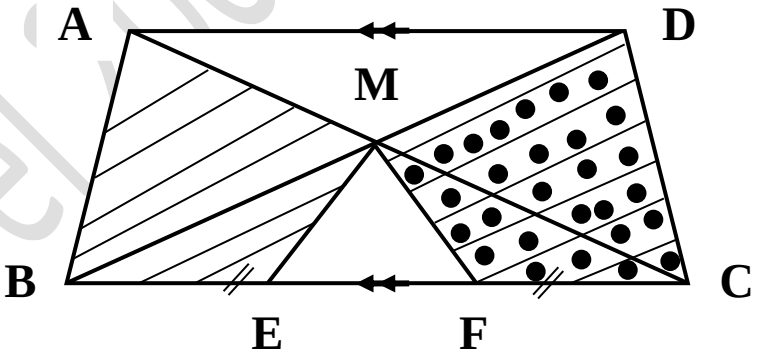
2) $In\ the\ opposite\ figure$
$\overline{AD} \parallel \overline{BC}, \overline{BC}, \overline{AC} \cap \overline{BD} = \{M\}, E, F \in \overline{BC}\ where\ EB = FC$
$Prove\ that$:
$area\ of\ the\ figure\ ABEM = area\ of\ the\ figure\ DCFM$



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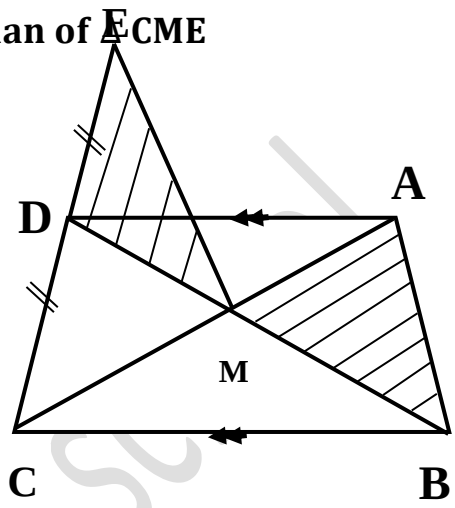
Homework

1) In the opposite figure

$\overline{AD} \parallel \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$, $\overline{MD}$ **is a median of** ΔCME

Prove that:

area of ΔAMB = **area of** ΔCME



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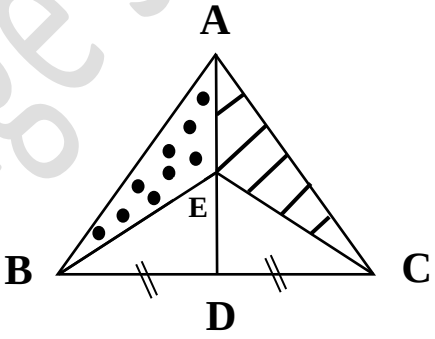
2) ***In the opposite figure***

$\overline{AD}$ ***is a median of*** ΔABC , $E \in \overline{AD}$

Prove that:

area of (ΔABE) = ***area of*** $\Delta(ACE)$



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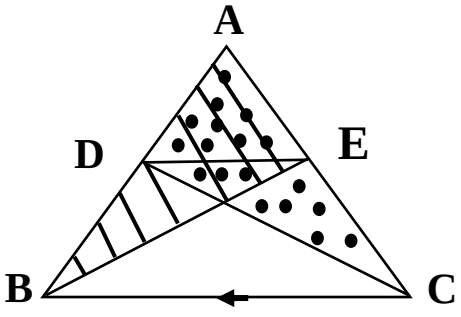
3) ***In the opposite figure***

$\overline{DE} \parallel \overline{BC}$

Prove that:

area of (ΔABE) = ***area of*** $\Delta(ACD)$



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Remember

*** The median of triangle divides its surface into two triangles equal in area.**
*** Two triangles which have the same base and lying between two parallel straight lines are equal in area.**
*** Two triangles with a common vertex and equal bases lie on the same straight line are equal in area.**

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Unit 4: Areas

Lesson 4 : Follow equality of areas of two triangles (the convers of the therom)

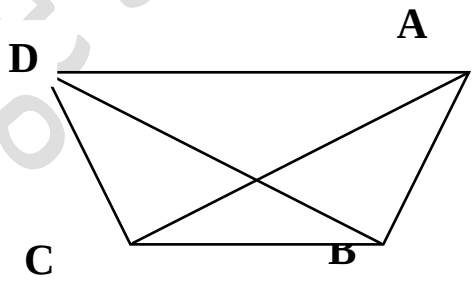
Board Summary

1)The two triangles which are equal in area and drawn on the same base *from one side of it then their vertices lie on a straight line parallel to this base*

2) ***In the opposite figure***

If area of $(\Delta\, ABD) =$ ***area of*** $\Delta(\, ACD\,)$ ***then***

… … ∥ … …



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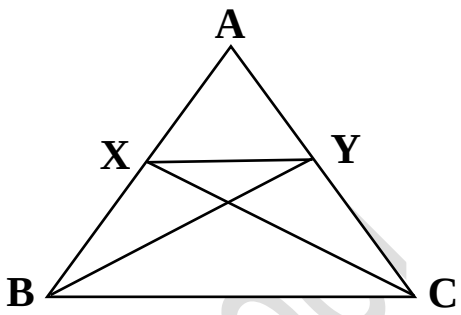
Evaluation

1) $If\ area\ \Delta\ AXC = area\ AYB\ ,\ \ Prove\ that: \overline{XY} \parallel \overline{BC}$



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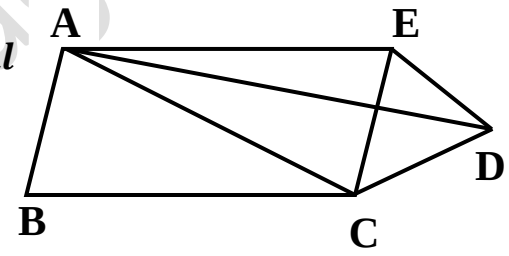
2) $In\ the\ opposite\ figure\ ABCD\ is\ a\ quadrilatural$
$area\ (\Delta\ ABC) = area\ \Delta(\ ADC\ ),$
$ABCE\ is\ a\ parallelogram\ Prove\ that: \overline{ED} \parallel \overline{AC}$



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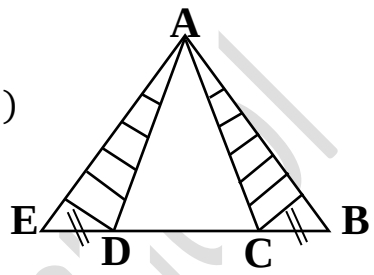
Homework

(1) Complete:

(1) ---------- *of a triangle divides its surface into two triangles equal in area.* (*Altitude , Median , side, otherwise*)

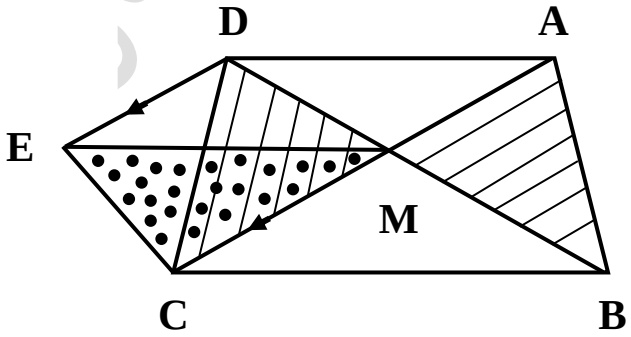
(2) *If* $BC = DE$ *then area* (ΔABC) ---------- *area* (ΔADE)
Where $D, C \in \overline{EB}$



(3) *The median of a triangle divides its surface into two triangles equal in* ----------
(*length – perimeter – area – volume*)

(4) *The two triangles which are equal in area and drawn on the same base from one side of it their vertices lie on a straight line* ---------- *this base*
(*parallel to – perpendicular to – equal to*)

(2) *If* $\overline{AC} \cap \overline{BD} = \{M\}$,
area ΔAMB = *area* ΔDMC
Prove that:
1) $\overline{AD} \parallel \overline{BC}$
2) *area* (ΔAMB) = *area* (ΔEMC)



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Algebra

1. Choose the correct answer:

1 If $(5x - 7)$ is a factor of the expression : $5x^2 - 2x - 7$, then the other factor is .....

(a) $x - 1$ (b) $x - 5$ (c) $x + 1$ (d) x

2 If the expression : $x^2 + ax - 5$ can be factorized , then a = ...

(a) 1 (b) 4 (c) 5 (d) 6

3 If the expression : $x^2 - cx + 12$ can be factorized , then c = ...

(a) – 1 (b) 4 (c) 7 (d) 1

4 Which of the following numbers can be added to the expression : $x^2 - 8x + 5$ to be factorized ?

(a) 1 (b) 2 (c) 4 (d) 5

5 The expression : $x^2 + 5x + m$ can be factorized , if m = ...

(a) 12 (b) 7 (c) – 14 (d) – 2

6 The expression : $x^2 + 5x + m$ can be factorized , if m = ...

(a) 5 (b) 1 (c) 6 (d) 7

7 The expression : $x^2 + 7x + b$ can be factorized , if b = ...

(a) 3 (b) 4 (c) 6 (d) 7

8 If $(x + 3)$ is one factor of the expression : $x^2 + x - 6$, then the other factor is .....

(a) $x - 2$ (b) $x - 3$ (c) $x + 2$ (d) $x + 6$

9 If the expression : $x^2 + ax - 12$ can be factorized , then a may be equal to .....

(a) 12 (b) – 8 (c) 8 (d) – 1

10 The number can be added to the expression : $2x^2 + 5x - 10$ to be factorized is .....

(a) – 1 (b) – 2 (c) – 3 (d) – 4

11 $5x^2 - 7x - 6 = (5x + 3)(x - .....)$

(a) 3 (b) 2 (c) – 3 (d) – 2

12 If $(2a - 5)(3a - 2) = 6a^2 + ka + 10$, then k = ...

(a) 15 (b) 19 (c) – 19 (d) 4

---

13 $2x^2 + 5x + 3 = (..... + 3)(x + 1)$

(a) x (b) $2x$ (c) $3x$ (d) $5x$

---

14 If $x^2 + kx + 25$ is a perfect square , then k = ...

(a) 5 (b) 10 (c) ± 10 (d) ± 5

---

15 If $x^2 - kx + 25$ is a perfect square , then k = ...

(a) 2 (b) 10 (c) 5 (d) 50

---

16 If $kx^2 + 12x + 9$ is a perfect square , then k = ...

(a) 3 (b) 4 (c) 9 (d) 16

---

17 $(x + 3y)^2 = x^2 + ... + 9y^2$

(a) $6xy$ (b) $9xy$ (c) $3xy$ (d) 6

---

18 If $y^2 + 12y + m$ is a perfect square , then m = ...

(a) 25 (b) 36 (c) – 36 (d) 100

---

19 If the expression : $x^2 - 6x - m$ is a perfect square , then m = ...

(a) – 9 (b) 1 (c) 2 (d) 9

---

20 The missing term in the expression : $9x^2 + ... + 16y^2$ to be a perfect square is .....

(a) $12xy$ (b) $24x$ (c) $24xy$ (d) $12x^2y^2$

---

21 If $x^2 - a = (x - 3)(x + 3)$, then a = ...

(a) 3 (b) – 3 (c) 9 (d) – 9

---

22 If $x - y = 3$, $x + y = 6$, then $x^2 - y^2$ = ...

(a) 12 (b) 9 (c) 3 (d) 18

---

23 If $x^2 - y^2 = 16$, $x - y = 2$, then $x + y$ = ...

(a) 4 (b) 8 (c) – 8 (d) 2

24 If $x + y = 3$, $x^2 - xy + y^2 = 5$, then $x^3 + y^3 =$ .....

(a) 15 (b) 25 (c) 8 (d) 7

---

25 If $a^3 - b^3 = 64$, $a^2 + ab + b^2 = 16$, then $a - b =$ .....

(a) 8 (b) -4 (c) 4 (d) 48

---

26 $(x + 1)(x^2 - x + 1) =$ .....

(a) $x^3 - 1$ (b) $x^3 + 1$ (c) $(x - 1)^3$ (d) $(x + 1)^3$

---

27 $(75)^2 - (25)^2 = 100 \times$ .....

(a) 75 (b) 50 (c) 100 (d) 25

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28 If $x^3 + y^3 = 28$, $x + y = 2$, then $x^2 - xy + y^2 =$ .....

(a) 48 (b) 14 (c) 2 (d) 7

---

29 The expression : $x^4 + 4$ can be factorized as a perfect square by adding the term ..... and its additive inverse.

(a) $4x^2$ (b) $2x^2$ (c) $8x^2$ (d) $4x^4$

---

30 If $x^2 - 2xy + y^2 = 25$, then $x - y =$ .....

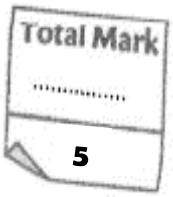
(a) 25 (b) -5 (c) 5 (d) ± 5

2. Answer the following:

1 Factorize each of the following completely :

1. $a x + b x + 5a + 5b$
2. $x^2 + 8x + 15$
3. $x^2 - 8x + 12$
4. $x^2 + 13x - 30$
5. $x^2 - 3x - 18$
6. $(c+d)^2 + 5(c+d) + 6$
7. $3x^2 + 7x + 2$
8. $2x^2 + x - 6$
9. $2x^2 - 3x + 1$
10. $2x^2 - 5x - 12$
11. $x^2 - 9$
12. $16x^2 - 9$
13. $8x^3 + 125$
14. $3x^3 - 81$
15. $a^3 + 0.008$
16. $b x + b y + c x + c y$
17. $x y + 3y + 5x + 15$
18. $a^2 + 2ab + b^2 - c^2$

Model 1



1 **Choose the correct answer from the given ones :** **(3 Marks)**

1 If $x - y = 5$, $x + y = 3$, then $x^2 - y^2 =$ .....

(a) 8 (b) 15 (c) 2 (d) $\frac{5}{3}$

2 $5x^2 - 7x - 6 = (5x + 3)(x -$ .....$)$

(a) 3 (b) 2 (c) -3 (d) -2

3 The expression : $x^2 - 5x + c$ is factorizable when c = ...

(a) 7 (b) 8 (c) -3 (d) 6

---

2 **Use the factorization to find :** $(98)^2 - 4$ **(2 Marks)**

Model 2

Total Mark 5

1 Choose the correct answer from the given ones : (3 Marks)

1 The expression : a $x^2 + 24x + 9$ is a perfect square , then a = ...

(a) 25 (b) 8 (c) 16 (d) 4

2 $2x^2 + 5x + 3 = (\ldots\ldots + 3)(x + 1)$

(a) x (b) $2x$ (c) $3x$ (d) $5x$

3 If $x^2 - a = (x - 3)(x + 3)$, then a = ...

(a) 3 (b) – 3 (c) 9 (d) – 9

---

2 Factorize : (2 Marks)

1 $3x^2 + 7x + 2$

2 $3x^3 + 81$

Model 3

Total Mark 5

1 Choose the correct answer from the given ones : (3 Marks)

1 $(x+3y)^2 = x^2 + \ldots\ldots\ldots\ldots + 9y^2$

(a) $6xy$ (b) $9xy$ (c) $3xy$ (d) 6

2 If $x+y=3$, $x^2-xy+y^2=5$, then $x^3+y^3 = \ldots\ldots\ldots\ldots$

(a) 15 (b) 25 (c) 8 (d) 7

3 If $2x^2+cx-3=(2x+3)(x-1)$, then $c = \ldots\ldots\ldots\ldots$

(a) 3 (b) 1 (c) -2 (d) 4

---

2 Factorize : (2 Marks)

1 x^3-8

2 $ax-5x+3a-15$

The Answers (1. Choose the correct answer)

1 (c)	2 (b)	3 (c)	4 (b)	5 (c)
6 (c)	7 (c)	8 (a)	9 (d)	10 (b)
11 (b)	12 (c)	13 (b)	14 (c)	15 (b)
16 (b)	17 (a)	18 (b)	19 (a)	20 (c)
21 (c)	22 (d)	23 (b)	24 (a)	25 (c)
26 (b)	27 (b)	28 (b)	29 (a)	30 (d)

The Answers (2. Answer the following)

1 $a(x+5)+b(x+5)=(x+5)(a+b)$

2 $(x+3)(x+5)$

3 $(x-2)(x-6)$

4 $(x-2)(x+15)$

5 $(x+3)(x-6)$

6 $((c+d)+2)((c+d)+3)$

7 $(3x+1)(x+2)$

8 $(2x-3)(x+2)$

9 $(2x-1)(x-1)$

10 $(2x+3)(x-4)$

11 $(x-3)(x+3)$

12 $(4x-3)(4x+3)$

13 $(2x+5)(4x^2-10x+25)$

14 $3(x-3)(x^2+3x+9)$

15 $(a+0.2)(a^2-0.2a+0.04)$

16 $x(b+c)+y(b+c)=(b+c)(x+y)$

17 $y(x+3)+5(x+3)=(x+3)(y+5)$

18 $(a+b)^2-c^2=(a+b+c)(a+b-c)$

Geometry

1. Choose the correct answer:

1 If the base length of a parallelogram is 7 cm. and the corresponding height is 4 cm. , then its area equals .....

(a) 11 cm^2 (b) 14 cm^2 (c) 22 cm^2 (d) 28 cm^2

---

2 If the area of a parallelogram is 35 cm^2 and the length of one of its sides is 7 cm. , then the corresponding height to this side is ..... cm.

(a) 10 (b) 5 (c) 7 (d) $\frac{5}{2}$

---

3 The area of the parallelogram in which the lengths of two adjacent sides are 5 cm. and 7 cm. and its smaller height is 4 cm. equals ..... cm^2

(a) 120 (b) 28 (c) 35 (d) 20

---

4 If the lengths of two adjacent sides of a parallelogram are 6 cm. and 7 cm. and its greater height is 5 cm. , then its area equals ..... cm^2

(a) 30 (b) 35 (c) 42 (d) 49

---

5 If the lengths of two adjacent sides of a parallelogram are 9 cm. and 6 cm. and its smaller height is 4 cm. , then its greater height is ..... cm.

(a) 36 (b) 24 (c) 12 (d) 6

---

6 The area of a triangle is ..... the area of a parallelogram if they have a common base lying on one of two parallel straight lines including them.

(a) equal to (b) half (c) twice (d) quarter

---

7 The ratio between the area of the parallelogram and the area of the triangle whose base is common and are included between two parallel straight lines equals .....

(a) 1 : 2 (b) 1 : 3 (c) 2 : 1 (d) 2 : 3

---

8 If ABCD is a parallelogram , $E \in \overline{AD}$, the area of Δ EBC = 35 cm^2 , then the area of $\square$ ABCD = ... cm^2

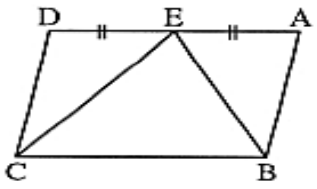
(a) 35 (b) 70 (c) 17 (d) 17.5

9 **In the opposite figure :**

If ABCD is a parallelogram ,

its area = 24 cm^2

, then the area of Δ ABE = ... cm^2



(a) 24 (b) 12 (c) 8 (d) 6

---

10 The triangle whose base length is 12 cm. and its area is 48 cm^2 , then the corresponding height is .....

(a) 3 cm. (b) 4 cm. (c) 6 cm. (d) 8 cm.

---

11 If the area of a triangle is 24 cm^2 and its height is 8 cm. , then the length of the corresponding base is ..... cm.

(a) 16 (b) 6 (c) 3 (d) 2

---

12 The area of the rectangle whose dimensions are 6 cm. and 4 cm. ..... the area of the triangle whose base length is 12 cm. and its corresponding height is 4 cm.

(a) < (b) > (c) = (d) ≠

---

13 The median of a triangle divides its surface into two triangular surfaces .....

(a) congruent. (b) equal in area. (c) similar. (d) coincide.

---

14 ABC is a triangle in which D is the midpoint of $\overline{BC}$, then Δ ABD , Δ ACD are .....

(a) similar. (b) equal in area.

(c) congruent. (d) all the previous.

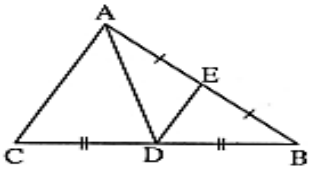
---

15 **In the opposite figure :**

The area of Δ AED = ... the area of Δ ABC

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) $\frac{1}{4}$ (d) $\frac{1}{8}$



---

16 If ABCD is a parallelogram whose area is 100 cm^2 , E ∈ $\overline{AD}$, F is the midpoint of $\overline{BC}$, then the area of Δ EBF = ... cm^2

(a) 100 (b) 50 (c) 10 (d) 25

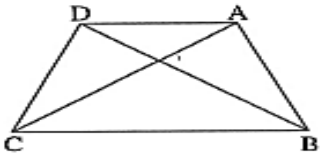
17 **In the opposite figure :**

If the area of Δ ABC = the area of Δ DBC

, then .....

(a) $\overline{AB}$ // $\overline{CD}$ (b) AB = CD

(c) $\overline{AD}$ // $\overline{BC}$ (d) AD = BC



2. Answer the following:

1 Find the area of the parallelogram in which the lengths of two adjacent sides are 6 cm. and 8 cm. and its greater height is 5 cm.

---

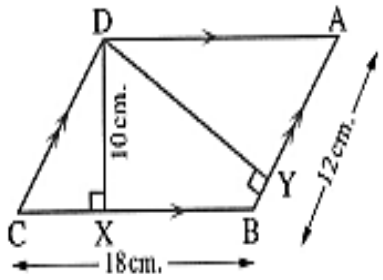
2 **In the opposite figure :**

ABCD is a parallelogram , AB = 12 cm.

, BC = 18 cm. , DX = 10 cm.

Find : [1] The area of ▱ ABCD

[2] The length of $\overline{DY}$



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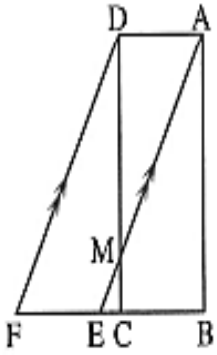
3 **In the opposite figure :**

ABCD is a rectangle , $\overline{AE} // \overline{DF}$

, $E \in \overrightarrow{BC}$, $F \in \overrightarrow{BC}$

Prove that :

The area of the figure ABCM = the area of the figure DMEF



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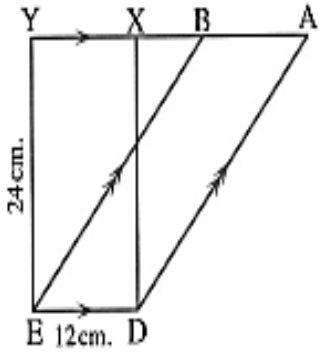
4 **In the opposite figure :**

$\overleftrightarrow{AB} // \overleftrightarrow{DE}$, $X \in \overrightarrow{AB}$, $Y \in \overrightarrow{AB}$

, XDEY is a rectangle , $\overline{AD} // \overline{BE}$

, DE = 12 cm. , YE = 24 cm.

Find : The area of the figure ABED



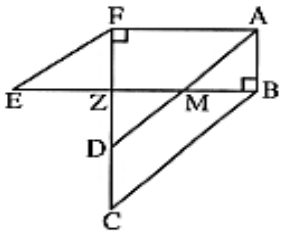
5 **In the opposite figure :**

ABZF is a rectangle

, ABCD , AMEF are two parallelograms

Prove that :

The area of ▱ ABCD = the area of ▱ AMEF



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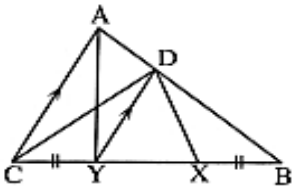
6 **In the opposite figure :**

$\overline{DY}$ // $\overline{AC}$, BX = YC

Prove that :

The area of Δ BDX = the area of Δ AYD



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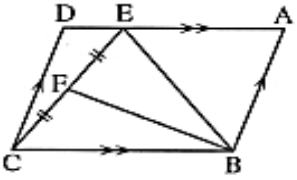
7 **In the opposite figure :**

ABCD is a parallelogram whose area is 40 cm^2

, F is the midpoint of $\overline{EC}$, E ∈ $\overline{AD}$

Find : The area of Δ BEF



---

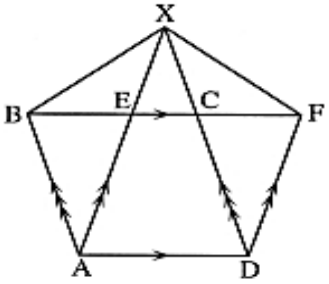
8 **In the opposite figure :**

ABCD , AEFD are two parallelograms

, $\overrightarrow{AE} \cap \overrightarrow{DC} = \{X\}$

Prove that :

The area of Δ ABX = the area of Δ DFX



---

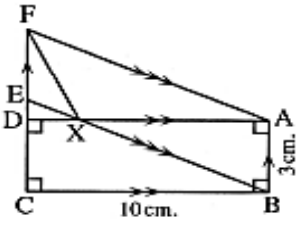
9 **In the opposite figure :**

ABCD is a rectangle

, AFEB is a parallelogram

, AB = 3 cm. , BC = 10 cm.

Find by proof : The area of Δ AFX



---

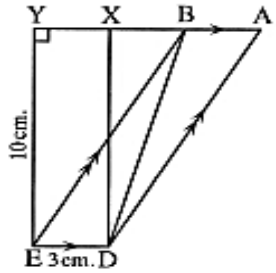
10 **In the opposite figure :**

$\overrightarrow{BA}$ // $\overrightarrow{DE}$, X ∈ $\overrightarrow{BA}$, Y ∈ $\overrightarrow{BA}$

, EDXY is a rectangle , $\overline{AD}$ // $\overline{EB}$

, ED = 3 cm. , EY = 10 cm.

Find by proof : The area of Δ ADB



Model 1

Total Mark 5

1 Choose the correct answer from the given ones : (3 Marks)

1 The area of a triangle is ..... the area of a parallelogram if they have a common base lying on one of two parallel straight lines including them.

(a) equal to (b) half (c) twice (d) quarter

2 The area of a rectangle is 40 cm^2 and its length 8 cm. , then its width ..... cm.

(a) 32 (b) 5 (c) 48 (d) 320

3 If the lengths of two adjacent sides of a parallelogram are 10 cm. , 8 cm. and the smaller height 4 cm. , then its area equals ..... cm^2

(a) 32 (b) 40 (c) 5 (d) 36

---

2 In the opposite figure : (2 Marks)

ABCD is a rectangle , ABEF is a parallelogram

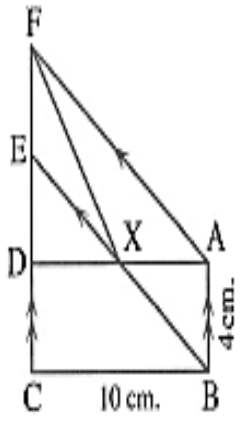
, $D \in \overline{CF}$, $E \in \overline{CF}$, $X \in \overline{BE}$

, AB = 4 cm. , BC = 10 cm.

Find :

1 Area of $\square$ ABEF

2 Area of Δ XAF



Model 2

Total Mark 5

1 Choose the correct answer from the given ones : (3 Marks)

1 The area of triangle = ... of the length of the base × its corresponding height.

(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) twice (d) $\frac{1}{2}$

2 If ABCD is a parallelogram , $E \in \overline{AD}$, the area of Δ EBC = 35 cm^2

, then the area of $\square$ ABCD = ... cm^2

(a) 35 (b) 70 (c) 17 (d) 17.5

3 The ratio between the area of the triangle and the area of the parallelogram which have a common base and between two parallel straight lines is .....

(a) 1 : 3 (b) 2 : 4 (c) 2 : 1 (d) 1 : 1

---

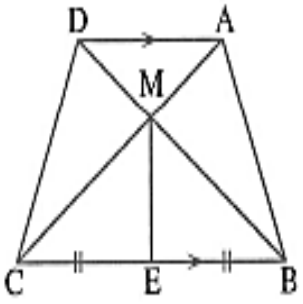
2 In the opposite figure : (2 Marks)

$\overline{AD} // \overline{BC}$, $\overline{AC} \cap \overline{BD} = \{M\}$

, E is the midpoint of $\overline{BC}$

Prove that :

The area of the figure ABEM = the area of the figure DCEM



Model 3

Total Mark 5

1 Choose the correct answer from the given ones : (3 Marks)

1 The triangle whose base length is 12 cm. and its area is 48 cm^2 , then the corresponding height is .....

(a) 3 cm. (b) 4 cm. (c) 6 cm. (d) 8 cm.

2 If the lengths of two adjacent sides of a parallelogram are 9 cm. and 6 cm. and its smaller height is 4 cm. , then its greater height is ..... cm.

(a) 36 (b) 24 (c) 12 (d) 6

3 The ratio between the area of the parallelogram and the area of the triangle whose base is common and are included between two parallel straight lines equals .....

(a) 1 : 2 (b) 1 : 3 (c) 2 : 1 (d) 2 : 3

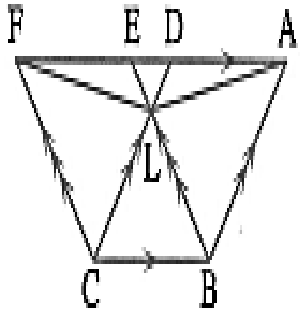
---

2 In the opposite figure : (2 Marks)

ABCD , EBCF are two parallelograms

, $\overline{BE} \cap \overline{CD} = \{L\}$, $D \in \overline{AF}$

, $E \in \overline{AF}$



Prove that : The area of ΔABL = the area of ΔFCL

The Answers (1. Choose the correct answer)

1 (d)	2 (b)	3 (b)	4 (a)	5 (d)
6 (b)	7 (c)	8 (b)	9 (d)	10 (d)
11 (b)	12 (c)	13 (b)	14 (b)	15 (c)
16 (d)	17 (c)	18 (b)	19 (b)	20 (c)

The Answers (2. Answer the following)

1

The area of the parallelogram $= 6 \times 5 = 30$ cm^2

2

(1) The area of $\square$ ABCD $= BC \times DX = 18 \times 10$

$= 180$ cm^2

(2) $DY = \frac{\text{the area}}{AB} = \frac{180}{12} = 15$ cm.

3

$\because$ ABCD is a rectangle $\therefore \overline{AD} \parallel \overline{BC}$

$\therefore \overline{AD} \parallel \overline{EF}$

, $\because \overline{AE} \parallel \overline{DF}$

$\therefore$ AEFD is a parallelogram

, ∵ the rectangle ABCD , ▱ AEFD have the common base $\overline{AD}$, $\overleftrightarrow{AD} // \overleftrightarrow{BF}$

∴ The area of the rectangle ABCD

= the area of ▱ AEFD

Subtracting the area of Δ AMD from both sides

∴ The area of the figure ABCM

= the area of the figure DMEF (Q.E.D.)

4

∵ $\overleftrightarrow{AB} // \overleftrightarrow{DE}$

, $\overline{AD} // \overline{BE}$ ∴ ABED is a parallelogram

, ∵ the rectangle XYED , ▱ ABED have the common base $\overline{DE}$, $\overleftrightarrow{AB} // \overleftrightarrow{DE}$

∴ The area of ▱ ABED

= The area of the rectangle XYED

, ∵ the area of the rectangle XYED = 12 × 24

= 288 cm²

∴ The area of ▱ ABED = 288 cm² (The req.)

5

∵ ▱ ABCD , □ ABZF have the common base $\overline{AB}$

, $\overline{AB} // \overline{CF}$

∴ The area of ▱ ABCD = The area of □ ABZF (1)

, ∵ ▱ AMEF , □ ABZF have the common base $\overline{AF}$

, $\overline{AF} // \overline{BE}$

∴ The area of ▱ AMEF = The area of □ ABZF (2)

From (1) and (2) :

∴ The area of ▱ ABCD = The area of ▱ AMEF

(Q.E.D.)

6

∵ ΔΔ BDX , DCY have equal bases in length and on one straight line and they have the same vertex D

∴ The area of Δ BDX = The area of Δ DCY (1)

, ∵ ΔΔ DCY , AYD have the common base $\overline{DY}$

, $\overline{DY} // \overline{AC}$

∴ The area of Δ DCY = The area of Δ AYD (2)

From (1) and (2) :

∴ The area of Δ BDX = The area of Δ AYD (Q.E.D.)

7

∵ Δ EBC , ▱ ABCD have the common base $\overline{BC}$

, $E \in \overline{AD}$

∴ The area of Δ BEC = $\frac{1}{2}$ The area of ▱ ABCD

= $\frac{1}{2} \times 40 = 20$ cm²

, ∵ F is the midpoint of $\overline{CE}$

∴ $\overline{BF}$ is a median in Δ BEC

∴ The area of Δ BEF = $\frac{1}{2}$ The area of Δ BEC

= $\frac{1}{2} \times 20 = 10$ cm² (The req.)

8

∵ The two parallelograms ABCD and AEFD have the common base $\overline{AD}$

, $\overleftrightarrow{BF} \parallel \overleftrightarrow{AD}$

∴ The area of ▱ ABCD = The area of ▱ AEFD (1)

∵ Δ ABX , ▱ ABCD have the common base $\overline{AB}$

, $X \in \overleftrightarrow{DC}$

∴ The area of Δ ABX = $\frac{1}{2}$ The area of ▱ ABCD (2)

∵ Δ DFX and ▱ AEFD have the common base $\overline{DF}$

, $X \in \overleftrightarrow{AE}$

∴ The area of Δ DFX = $\frac{1}{2}$ The area of ▱ AEFD (3)

From (1) , (2) and (3) :

∴ The area of Δ ABX = The area of Δ DFX (Q.E.D.)

9

∵ The parallelogram ABEF and the rectangle ABCD have the common base $\overline{AB}$

, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CF}$

∴ The area of ▱ ABEF

= The area of the rectangle ABCD = 3 × 10 = 30 cm²

, ∵ Δ AFX and ▱ ABEF have the common base $\overline{AF}$

, $X \in \overleftrightarrow{BE}$

∴ The area of Δ AFX = $\frac{1}{2}$ The area of ▱ ABEF

= $\frac{1}{2} \times 30 = 15$ cm² (The req.)

10

∵ $\overleftrightarrow{AB} \parallel \overleftrightarrow{DE}$

, $\overleftrightarrow{AD} \parallel \overleftrightarrow{BE}$ ∴ ABED is a parallelogram

, ∵ the rectangle XYED and ▱ ABED have the common base $\overline{DE}$

, $\overleftrightarrow{AB} \parallel \overleftrightarrow{DE}$

∴ The area of the rectangle XYED

= The area of ▱ ABED (i)

, ∵ Δ ABD and ▱ ABED have the common base $\overline{AD}$

, $B \in \overline{BE}$

∴ The area of Δ ABD = $\frac{1}{2}$ The area of ▱ ABED (2)

From (1) and (2) :

∴ The area of Δ ABD

= $\frac{1}{2}$ The area of the rectangle XYED

= $\frac{1}{2} \times 10 \times 3 = 15$ cm² (The req.)